



Space based aviation applications

Cristian Pradera

ATM Modernisation Planning Coordinator

SESAR Deployment Manager

World ATM Conference, Madrid, 22 June 2022



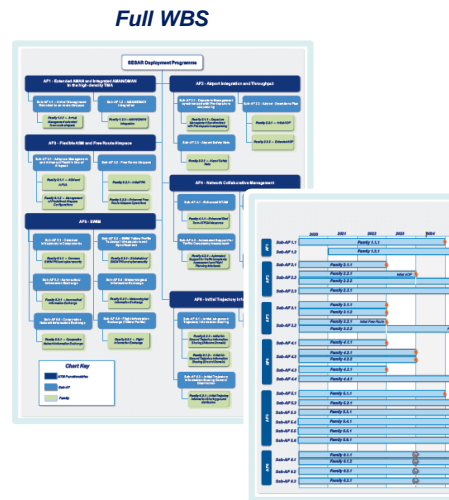
SESAR Deployment Programme

A common blueprint for operational stakeholders to implement CP1

The **SESAR Deployment Programme** features fully up-to-date information on **target dates**, **system requirements**, **specific deployment milestones**, **synchronisation needs**, **expected performance impacts** and many more

SESAR Deployment Programme 2022

Delivering ATM modernisation in Europe together



Detailed descriptions

Sub-AF 3.1 - Arrival Management extended to en-route airports

Family 3.1.1 - Arrival Management extended to en-route airports

Target Date: 31/12/2024

Description: This family addresses the implementation of extended arrival management by the en-route traffic to the busiest airports in Europe. The Arrival Manager is extended to en-route operations of ANM as defined by the implementation of 100 reduced miles from the original arrival boundaries to be considered. Due to the geographical location of the arrival at the ANM horizon, this does not provide additional performance benefits. Traffic impact is considered in the en-route sector up to 100 miles from the original arrival boundary. Existing ANM horizon may affect the airports design, and 6 en-route sectors including military activities are considered.

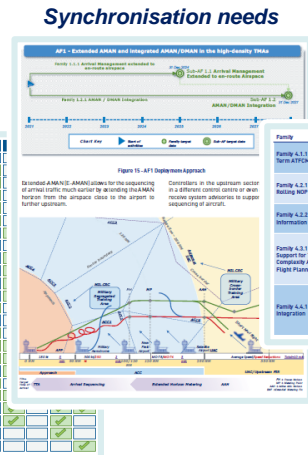
System requirements: ANM units implementing extended ANM operations shall coordinate with Air Traffic responsible for adjacent and adjacent en-route sectors as well as ATIS units responsible for adjacent sectors impacted by the Extended ANM horizon. Input data to be provided by the most appropriate (operator/ provider) information available (route available via the NM 8200 published/under the mechanism).

Dependencies: AF 2 Family 3.1.1 - Extended ANM will support current operations management & information, including current capabilities in place and propose for air-traffic control, current capabilities for separating traffic between ANM and ENM operations for 100 miles.

Impacted stakeholders: AF 3 Family 3.1.1 - There are no impacted stakeholders. Impacted stakeholders are impacted target times for improved ATCM and arrival sequencing set out in AF 4. Family 3.1.1 High Information Services. To ensure interoperability, data exchanged Extended ANM shall be implemented as a SWM service. Unless SWM is available, technology that is used.

GANTT Chart

Impacted stakeholders



Matching SOL and OBJ

Performance benefits

Benefit area	Capacity	Flight efficiency	CO ₂ emissions	Cost efficiency	Safety	Predictability	Noise	Significance	Interoperability
Benefit area	Capacity	Flight efficiency	CO ₂ emissions	Cost efficiency	Safety	Predictability	Noise	Significance	Interoperability

Intermediate milestones

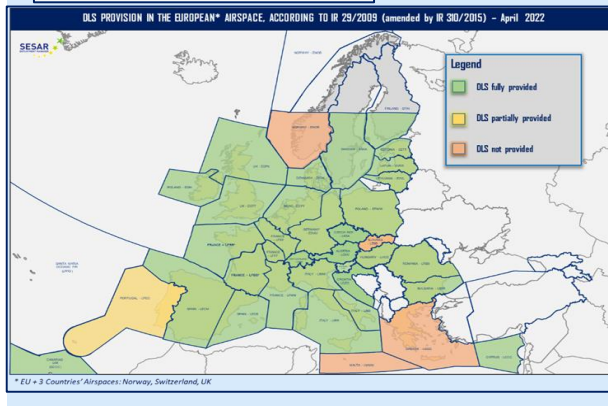
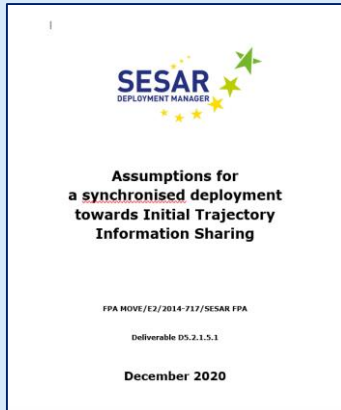
SDM experience coordinating CNS deployment



Communications



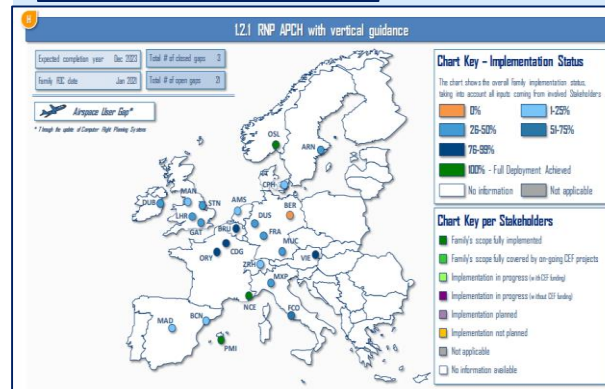
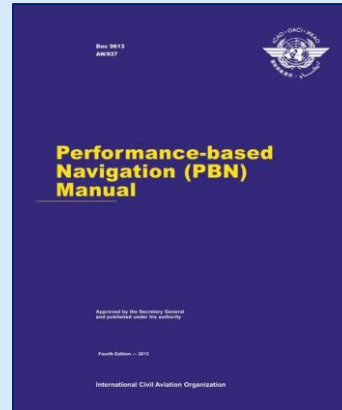
DLS



Navigation



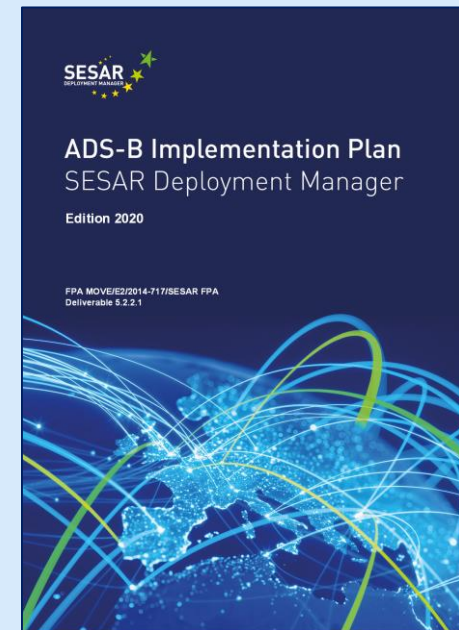
PBN



Surveillance



ADS-B

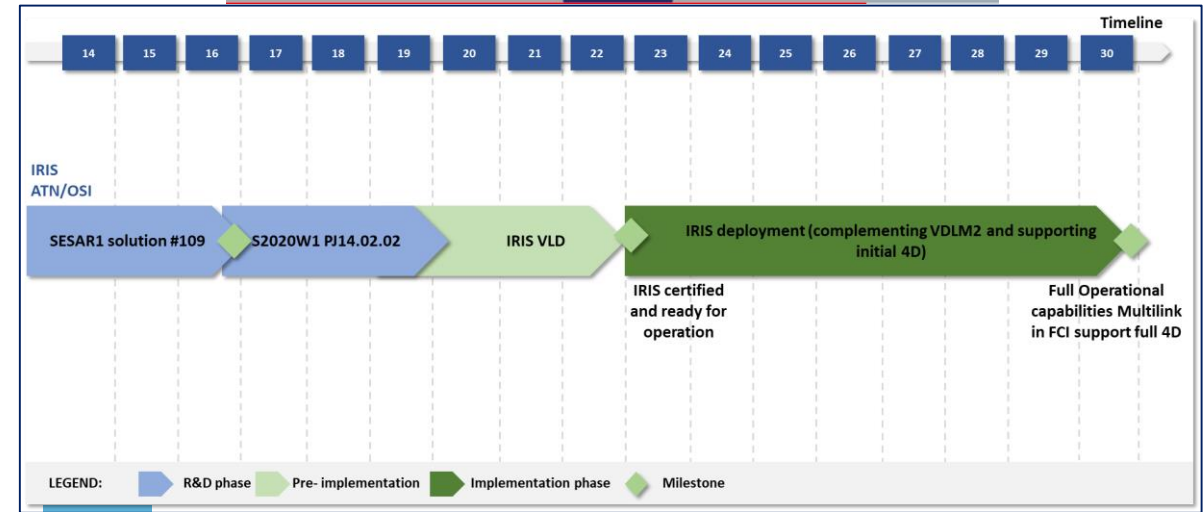
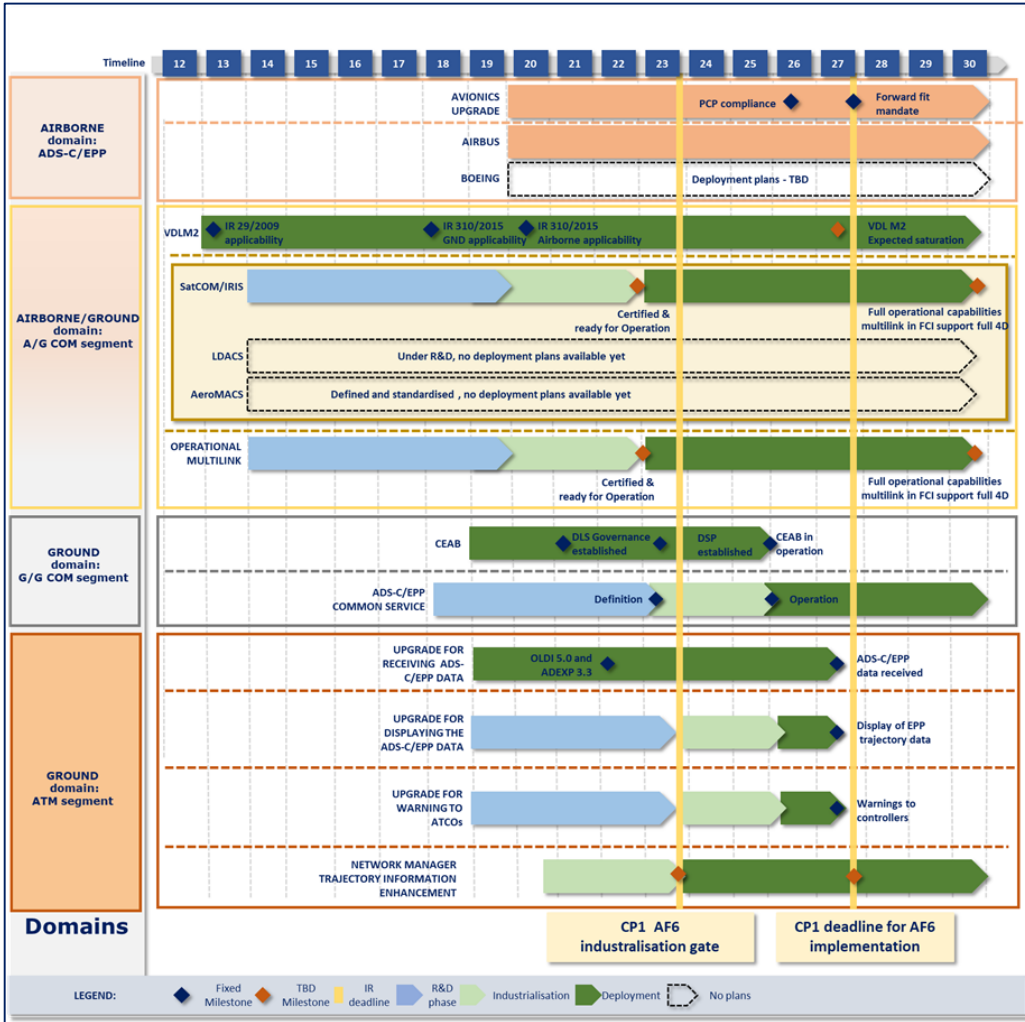




Communication. SATCOM



SDM Deliverable: Assumptions for a synchronized deployment towards Initial Trajectory Information Sharing



SatCOM roadmap – based on “IRIS”

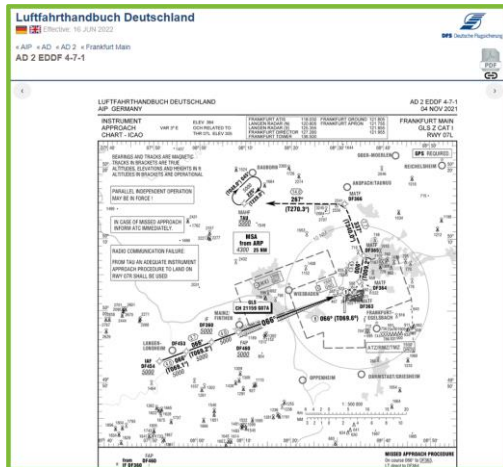
SDM, together with the stakeholders, to develop a multilink implementation roadmap



Navigation. GBAS and GALILEO

Deployment status:

- GAST D (CAT III on GPS only)
 - Standardized in Annex 10 since 2018
 - Airborne equipment expected 2023 (B777-9), 2025 ? (Airbus)
 - Ground stuck at certification amid pandemic
- EU proposal at ICAO NSP JWG8 to implement “GAST D +” as transition towards GAST F
 - Adding GALILEO to the GAST D standard
 - Gain experience with MC in GAST D (compatible to existing GAST D avionics)
 - In a second step complete with full DFMC performance standard



SDM supported Enabling European GBAS Growth (EGG)

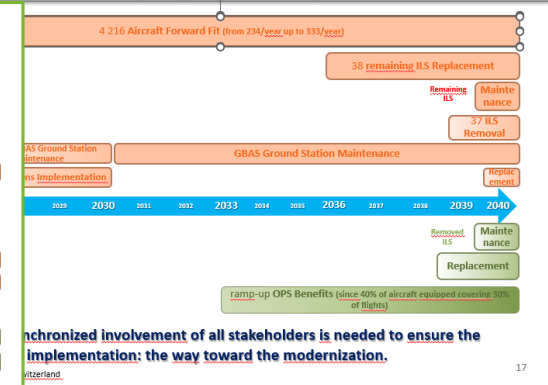


SDM elaborated a GBAS CBA

GBAS - Deployment & ILS Decommissioning Scenario 2

A manageable scenario, with Satellites technologies, Best Equipped Best Served

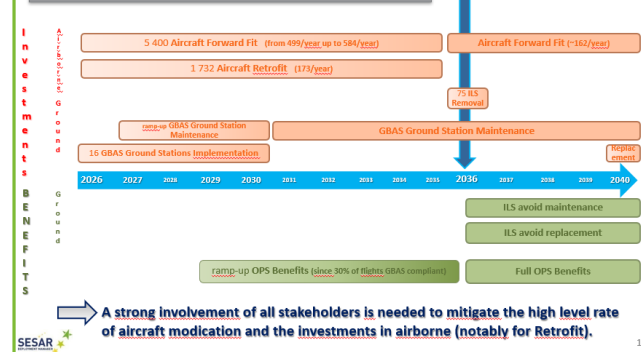
EU registered aircraft* GBAS compliant, on@Forward Fit, 50% of ILS decommissioned



GBAS - Deployment & ILS Decommissioning Scenario 1

A pro active scenario, 2036: switch from ILS to Satellites technologies

2036: Full GBAS Compliance, all ILS decommissioned



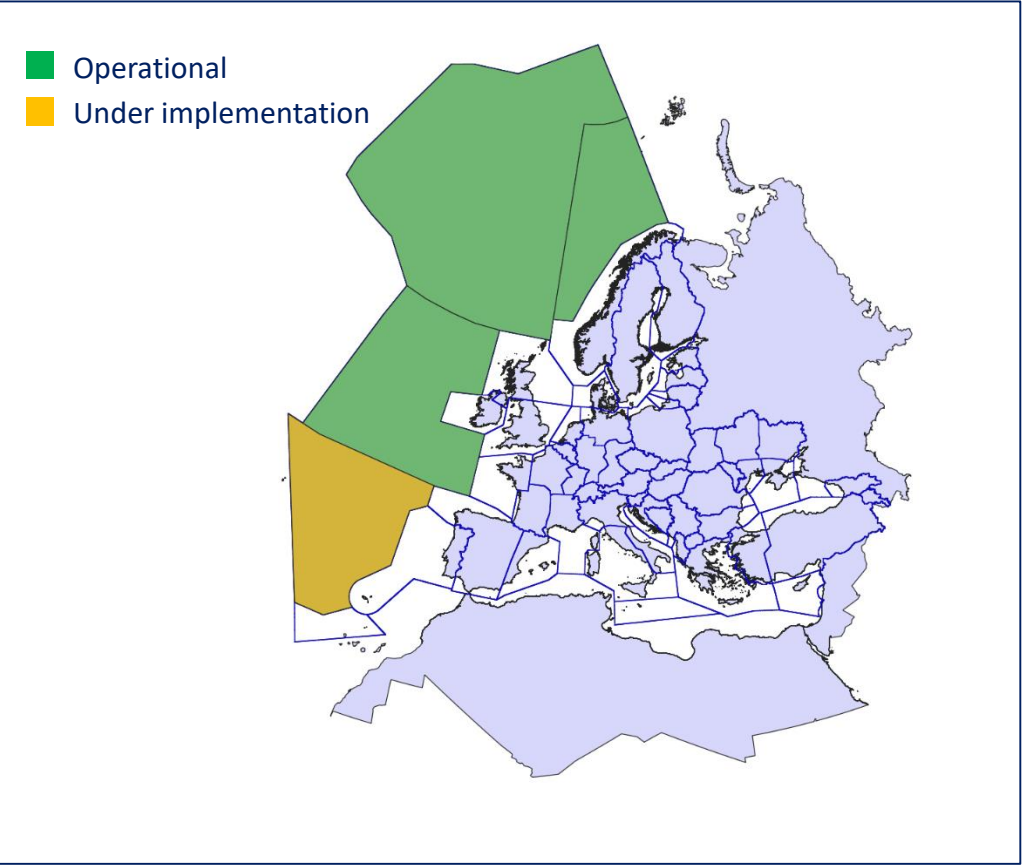
A strong involvement of all stakeholders is needed to mitigate the high level rate of aircraft modification and the investments in airborne (notably for Retrofit).

Synchronized involvement of all stakeholders is needed to ensure the implementation: the way toward the modernization.



Surveillance. Satellite-based ADS-B Out

Implementation status in Europe Satellite-based ADS-B coverage



Pros



- Global coverage, independent of terrain
- Can independently validate position using TDOA



Cons



- Performance weaker towards the equator due to more sparse constellation configuration
- Difficult to meet terrestrial ADS-B on cost and update probability at high update rates
- Detection issues in aircraft with bottom-only





Modernising Air Traffic Management As One

Follow SESAR deployment:

Twitter: [@SESAR_DM](#)

LinkedIn: [SESAR Deployment Manager](#)

Facebook: [@SESARDeploymentManager](#)

Instagram: [sesar_deployment](#)